

IN THE SPECIFICATION:

Please replace the paragraph beginning on page 3, line 4, with the following rewritten paragraph:

SA systems ~~is~~are installed outside the production line ('off-line') and wafers to be measured by this system are supplied thereto from the production line after the wafer processing is completed. The known SA systems for CMP are OptiProbe 2500, commercially available from ThermaWave, USA, and UV1250, commercially available from KLA-Tencor, USA. SA systems have excellent capability to provide full and accurate information concerning the measurement parameters. However, SA systems suffer from several drawbacks such as ~~relatively long time to respond~~a lag in response time, large footprinting, and clean room and additional handling of wafers issues.

Please replace the paragraph beginning on page 3, line 14, with the following rewritten paragraph:

(2) In-situ detectors

These are various sensors (optical, electrical, mechanical, etc.) which are installed in the working area (~~in-situ~~in-situ) of the processing tool (e.g., the area between the wafer and the rotating pad of the polisher), ~~and~~ are capable of real-time detecting the process

end-point (e.g., motor current), and of continuously detecting the product parameters (e.g., thickness) and both product and process parameters (e.g., removal rate). Such an in-situ end-point detector (EPD) to be used with CMP equipment is disclosed, for example, in US Patent No. 5,433,651. The end-point detector comprises a window, which enables in-situ viewing of the polishing surface of the workpiece from an underside of the polishing table during polishing. Reflectance measurement means are coupled to the window on the underside of the polishing table. A prescribed change in the in-situ reflectance corresponds to a prescribed condition of the polishing process.

Please replace the paragraph beginning on page 3, line 26, with the following rewritten paragraph:

An EPD reduces the time required to qualify a process, and shortens conditioning time whenever pads are replaced. ~~EPD~~EPDs are mainly used in processes such as plasma etching. The known EPD tools for CMP are models 2350/2450 Endpoint Controllers, commercially available from Luxtron, Santa Clara, USA, and ISRM, commercially available from Applied Materials, Santa Clara, USA.

Please replace the paragraph beginning on page 5, line 1, with the following rewritten paragraph:

The main difficulty in obtaining high accuracy in optical EPD is signal dependency on wafer pattern, since EPD spot size includes a lot of features with different layers structure. The effect may be stronger than signal change during polishing. There is a great variety of approaches aimed at increasing the accuracy of the endpoint detection. US Patent No. ~~5,910,001~~ 5,910,001 discloses a method and apparatus for in-situ monitoring, using multiple process parameters. This technique utilizes analyses of the multiple process parameters and statistical correlation of these parameters to detect changes in process characteristics, such that the endpoint of the etching process may be accurately detected. Another improved endpoint technique is disclosed in US Patent No. 5,964,980. Here, a fitted endpoint system provides normalizing the current endpoint curve generated from the series of multi-bit digital code words for a wafer being etched with respect to the standard endpoint curve and providing a normalized current endpoint curve.

Please replace the paragraph beginning on page 10, line 10, with the following rewritten paragraph:

Referring to Fig. 3, the main components of a polishing tool arrangement PE are schematically illustrated, utilizing an end-point detection system 10 according to the invention. The polishing tool arrangement PE is typically composed of such main constructional parts as a polisher 12, a cleaner 14, wafers, a load/unload cassette station 16 and a robot 18 that transfers wafers between these parts. The system 10 is a combination of an EPD 20 and an Integrated Tool (IT) 22, both coupled to a control unit (CU) 23. The EPD is installed within the active polishing area (working area), e.g., the contact area between the wafer under polishing and the polisher's pads (which are not specifically shown). As for the IT 22, it is accommodated adjacent to the polisher 12. It should, however, be noted although not specifically shown, that the IT 22 could be installed inside the polisher, provided it is located outside the active polishing area.

Please replace the paragraph beginning on page 12, line 18, with the following rewritten paragraph:

Such a construction of the measurement unit, namely which provides the translation of the optical assembly with respect to the wafer, permits its integration within the

wafer processing tool or cluster, such as polisher, CVD chamber, etc. and provides thickness measurements immediately after completing the wafer processing. The window 48, together with the sealed housing 46, provides wafer thickness measurements in a medium similar (or the same) to the processing environment. For example, in the case of CMP, such a medium is water, and in the case of CVD or etching, it is a vacuum. Data generated by the ITM (measured parameters and acquired images) are processed by data and image-processing unit 40, being part of control unit ~~22~~23.

Please replace the paragraph beginning on page 13, line 18, with the following rewritten paragraph:

After completing the polishing process in accordance with the predetermined threshold criteria (e.g., polishing time, signal value within a predetermined frequency range, spectrum shape, etc.), the processed wafer is transferred to the ITM tool 22 (by robot 18), and positioned above the transparent window 48. The wafer W could be held above the window 48 by a vacuum holder (not shown), or by any other suitable mechanism. The optical assembly 42 performs thickness measurements on multiple desired sites of the wafer W (by moving the optical assembly with respect to the wafer). The thickness measurement

procedure performed by ITM is known *per se*,~~se~~ and therefore need not be specifically described.

Please replace the paragraph beginning on page 15, line 15, with the following rewritten paragraph:

In accordance with yet another preferred embodiment, pre-process thickness measurements are performed. This technique is preferred in such cases, where the end-point detectors of a kind providing cyclic signals are ~~used~~,used. Such a cyclic signal is usually generated by an EPD based on ~~interference measurements~~interference measurements, and is disclosed for example in US Patent No. 5,964,643. In this case, the end-point signal cyclically varies with the thickness of the layer being polished, as it is reduced during the CMP process. The CMP process in this case is terminated when a predetermined number of peaks (signal maximums) is obtained. Information regarding the layer thickness obtained before the polishing ~~starts~~,starts permits to ~~define~~ definition of this predetermined number of peaks corresponding to the desired thickness. Further adjusting of the threshold within the selected peak is performed in accordance with the above-described scheme.